



## STAT 305, 2022 Term 1 Instructor: William Welch

**Calendar description:** Review of probability theory. Sampling distribution theory, large sample theory and methods of estimation and hypothesis testing, including maximum likelihood estimation, likelihood ratio testing and confidence interval construction. [3-0-1]

**Learning outcomes:** There are detailed learning outcomes expanding greatly on the above at the end of each chapter in the course pack.

**Prerequisites:** Either (a) one of STAT 200, STAT 203, BIOL 300, STAT 241, STAT 251, COMM 291, ECON 325, FRST 231, PSYC 218, PSYC 366, and one of MATH 302, STAT 302; or (b) a score of 65% or higher in one of MATH 302, STAT 302. The Department recommends that students meet the prerequisite through option (a).

There will be several tasks in the first two weeks so you can check you have the prerequisite background for success in STAT 305.

**Textbook/course pack/course notes:** “STAT 305, Introduction to Statistics Inference” by Welch, W.J. (August 14, 2019 edition). Available at the bookstore.

**References:** “Mathematical Statistics and Data Analysis: (3<sup>rd</sup> edition) by Rice, J.A., on reserve at the Barber library. (The above course pack covers the topics of the course; the Rice text is suggested in case you want a second explanation of a specific topic. It is not necessary to purchase the Rice text.)

**Website:** [canvas.ubc.ca](http://canvas.ubc.ca)

**Classes:** MWF 4:00 – 5:00 pm in AERL 120. Each class will have an activity with iClicker questions. Much of the activity will involve group work. As such it requires in-person attendance and discussion, and hence classes will not be recorded. If you have to miss a class for whatever reason, please let the teaching team know how we can help, e.g., provide a copy of the in-class worksheet.

**Labs:** The 1-hour lab is Mon 8:00-9:00 am (L1A) or Mon 1:00-2:00 pm (L1B) or Wed 2:00-3:00 pm (L1C) or Fri 2:00-3:00 pm (L1D). Again, you will work in a group, requiring in-person attendance.

**Assessment:** 3 quizzes 45%, final exam 40%, labs 5%, WeBWorK assignments (every 1 to 2 weeks) 5%, in-class iClicker questions 5% (half participation, half correct answers)

To pass the course it is normally necessary to obtain 50% based on the quizzes and final examinations, i.e., 42.5 or more out of the maximum of 85 points. Otherwise the exam grade is


normally reported. If the 50% exam threshold is satisfied, the grade reported is weighted based on all assessment components above.

**Policy regarding missing the final exam:** Students who miss the final exam must report to their Faculty advising office within 72 hours of the missed exam, and must supply supporting documentation. Only your Faculty Advising office can grant deferred standing in a course; this is the only way of obtaining a deferred exam. You must also notify me prior to (if possible) or immediately after the missed exam. Your Advising office and I will let you know when you are expected to write your deferred exam. Please note that if you are granted deferred standing for the STAT 305 final exam in term 1, you will be expected to write your deferred exam with the term 2 sitting of the course in the April exam period. In such a case, make sure that you download the class notes from Canvas immediately, because you will not have access to them after December 31<sup>st</sup>.

**Quizzes:** Quizzes will be HELD IN THE 4:00 – 5:00 pm CLASSES on the following dates: **Oct 17, Nov 7, and Nov 23**. They will be held in the regular class time but **in ESB 1013**. They will start at 4:00 pm so please make sure you are on time. Quizzes will be based on all course materials up to that stage (details are in the course schedule), including graded assignments, other ungraded problems assigned from time to time, lectures, and activities held in lectures.

If you would like a quiz question remarked, send a regrade request, normally *no later than one week after the quiz was graded*. We will communicate at canvas the exact way to make a request when we have this figured out.

There will be no make-up quizzes. If you miss a quiz for a documented valid reason, the weights for the other quizzes and the final will be readjusted to total 85% (the quizzes and final make up 85% of the grading scheme).

If you miss an assignment or quiz for a valid reason, please fill out the "[Student Declaration of Academic Concession](#)"  and communicate it to us. (Again the exact method will be available at canvas when we have the details figured out). Please consult the Academic Concession page of the UBC [Vancouver Academic Calendar](#) for UBC policy. Valid reasons are typically acute or changed medical conditions, other emergencies, or an important UBC event. Please note that, as the quiz dates are known well in advance and are in class time, normally there will be no accommodation for other classes, vacations, social events, business transactions, or similar activities.

Please make your student ID available at the quizzes and final exam.

**WeBWork:** The purpose of the WeBWork assignments is to give you immediate feedback about your understanding of the material recently covered in the course. The limitations of online grading implies that these questions are fairly basic.

**Unmarked exercises:** Questions will also be suggested approximately weekly. The suggested questions will NOT be graded. Brief answers are often in the course text, and some answers may be taken up in office hours. No other solutions will be provided. If you cannot get started with a question or are stuck at some point in the solution, please see one of the teaching team during office hours. We are here to help YOU successfully complete the problem; it does not

help you if we do the problem for you. See us as often as you need to keep making progress. Working together in groups for these optional questions is allowed and indeed encouraged. One purpose of these exercises is to prepare you for the quizzes and final, where similar questions will appear. The suggested questions are not part of assessment but are also an (essential!) aid to learning by doing.

**Computing:** Computing is an integral part of this course, e.g., to compute required probabilities. We will use the R data-analysis environment. The course website has information about how you may access R on your own computer, data sets and examples, and several online R tutorials, including a “getting started guide”. Many of the assigned questions will involve computing. Familiarity with R will also be tested on the quizzes and final examination.

**Academic Integrity:** While academic studies build on past and current knowledge from others, it is essential that all academics, including students, make clear where past knowledge ends and their contributions begin. Also, group work is encouraged in some STAT 305 tasks, which may make it difficult for you to know what is and is not allowed. Here are some guidelines.

Basically, do not represent other people’s work as your own; that is plagiarism. For students in STAT 305, specifically:

1. iClicker responses are part of YOUR grade and YOU need to have contributed to group discussion in class. Secondly, sometimes a student is tempted to click also on behalf of another student who is not in attendance: that is definitely a violation of academic integrity.
2. YOUR grade for group lab work needs to reflect that YOU engaged and contributed fairly to the group effort.
3. WeBWorK is part of YOUR grade and all answers need to be substantially YOUR work.
4. You already know that the midterm and final exams should be YOUR work only.

Thus, submit and claim for credit only the work YOU have done, which includes writing text (and math) in your own words. That is the basis of academic integrity. Copying and representing others’ work as yours is cheating. There will be checks in place and any suspected violations will be followed up and penalized as appropriate with a report to Faculty of Science Advising, where records are kept across courses. Offences may be escalated to the President’s Advisory Committee on Student Discipline.

UBC’s policies on academic integrity are in the Academic Calendar at <http://calendar.ubc.ca/vancouver/index.cfm?tree=3,54,111,0>.

**Outline of topics:** The course will start at the section on moment generating functions in the course notes (preceding sections are prerequisite material) and then proceed closely following the order in the course notes.